

## REMARKS

### SECTION 103 REJECTION OF CLAIM 1

Claim 1 stands rejected as allegedly being rendered obvious by the combination of *Malozemoff*<sup>1</sup> and *Jin*.<sup>2</sup>

As best understood, the Examiner regards *Malozemoff* as teaching disposition of a precursor solution that comprises a rare earth salt, an alkaline earth salt, and a transition metal salt, one of which is a fluoride-containing salt.

*Malozemoff* does not disclose a precursor solution that comprises those three salts.

On page 19, *Malozemoff* describes a precursor with a rare earth salt, an alkaline earth salt, and a transition metal salts. But none of these are fluoride containing salts.

On page 25, *Malozemoff* describes a precursor made with copper oxide. But copper oxide is an oxide, not a salt.

The claim also requires a “precursor *solution*,” not a suspension.

It is unclear that copper oxide would even dissolve. Thus, it appears from the disclosure that the resulting precursor would be a *suspension*, not a solution.

The Examiner states that at page 7, *Malozemoff* describes disposition of a precursor solution having the recited ingredients onto a substrate.

Page 7 describes various alloys for a substrate. It does not describe constituents of a precursor solution to be disposed on that substrate.

The Examiner then states that one of ordinary skill in the art would have found it obvious to include a dopant in the precursor solution of *Malozemoff* “to make a

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<sup>1</sup> *Malozemoff*, WO2001/08169.

<sup>2</sup> *Jin*, et al., “Superconducting Properties of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub> with Partial Rare Earth Substitution” *Physica C*, vol. 173, pp. 75-79 (1991).

superconductor having a higher  $J_c$  than a YBCO superconductor without the substitution...as taught by *Jin*.”

In fact, one of ordinary skill in the art would have realized from *Jin* that replacing one rare earth by another would have very little effect on  $J_c$ . As the Examiner has already pointed out, *Jin* advises those who follow in his footsteps to forget about having the dopant replace a rare earth.<sup>3</sup> Specifically, *Jin* states:

“The result of the present work with the *insignificant* flux pinning enhancements by Y-site substitution suggests that future efforts should perhaps be concentrated on Ba-, Cu-, or O-site substitutions.”<sup>4</sup>

Thus, one of ordinary skill in the art who had read *Jin* would have been warned against providing a dopant metal that “partially replaces *the rare earth* of the rare earth/alkaline earth metal/transition metal oxide in the precursor solution.”

*Jin* would have suggested to one of ordinary skill in the art that it would be a much better idea for the dopant to replace an alkaline earth (e.g. Ba) or transition metal (e.g. Cu) atom, and *not* a rare earth atom.

However, Applicant’s claim specifically says that the dopant “partially replaces” the very atom that *Jin* suggests would have resulted in “*insignificant* flux pinning enhancements.” According to claim 1, the dopant “partially replaces *the rare earth*,” which is precisely what *Jin* says would result in “*insignificant* flux pinning enhancements.”

In direct contradiction to *Jin*’s prediction, Applicant was able to obtain significant flux pinning enhancements. Applicant in effect ignored *Jin*’s advice and achieved an unexpected result. The result is unexpected because *Jin* already tried substitution of dopant for rare earth, discovered that it was ineffective, and recommended that others try instead to substitute dopant for some other constituent.

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<sup>3</sup> Office Action of 3/31/2010, page 2.

<sup>4</sup> *Jin*, page 78, col. 2, [emphasis supplied].

Applicant speculates that the success of the claimed method may have arisen from its use in connection with a thin film rather than bulk superconductor. In hindsight, a difference may have arisen because grain boundaries in bulk superconductor differ from those in a thin film. However, the exact physical explanation for why Applicant's rare earth substitution succeeded while *Jin*'s failed is irrelevant to patentability.<sup>5</sup> What matters is that Applicant managed to achieve an unexpected result directly contrary to *Jin*'s advise.

Claim 72 recites similar limitations and is patentable for at least the same reasons.

The dependent claims are patentable for at least the same claims as claim 1, from which they ultimately dependent.

### **SECTION 103 REJECTION OF CLAIM 71 (*Malozemoff* and *Jin*)**

Claim 71 requires that the dopant component have two dopant metals, one to partially replace a rare earth and the other to partially replace an alkaline earth.

After having found that substituting a rare earth for another rare earth was not effective, *Jin* suggested substituting a rare earth in place of an alkaline earth. Thus, what *Jin* discloses is: either (1) substituting a rare earth in place of another rare earth, *or* (2) substituting a rare earth in place of an alkaline earth.

*Jin* does not disclose substituting a rare earth in place of another rare earth, *and* substituting a rare earth in place of an alkaline earth. Therefore, *Jin* would never have reason to provide a dopant component that has two separate dopants: a first dopant metal *and* a second dopant metal.

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<sup>5</sup> *Diamond Rubber Co. v. Consolidated Rubber Tire Co.*, 220 U.S. 428, 435-36 (1911), ("It is certainly not necessary that he understand or be able to state the scientific principles underlying his invention, and it is immaterial whether he can stand a successful examination as to the speculative ideas involved. . . . He must, indeed, make such disclosure and description of his invention that it may be put into practice. . . . This satisfies the law, which only requires as a condition of its protection that the world be given something new and that the world be taught how to use it. It is no concern of the world whether the principle upon which the new construction acts be obvious or obscure, so that it inheres in the new construction.")

**SECTION 103 REJECTION OF CLAIMS 71 AND 78 (*Malozemoff, Jin, and Chen*)**

The rejection of claims 71 and 78 based on the combination of *Malozemoff* and *Jin* is already discussed above in. However, both claims also stand rejected as being rendered obvious by the combination of *Malozemoff, Jin, and Chen*.<sup>6</sup>

*Chen* discloses starting with  $\text{ABa}_2\text{Cu}_3\text{O}_{7-x}$  (where “A” is a rare earth) and substituting another alkaline earth for some of the barium. The Examiner suggests that one of ordinary skill in the art would have found it obvious to replace some of the barium with a second dopant (i.e. another alkaline earth) “in order to produce a YBCO superconductor by precipitate producing process as taught by *Chen*.”<sup>7</sup>

The proposed motivation to modify the combined teachings of *Malozemoff* and *Jin* to replace some barium with another alkaline earth appears to have been cobbled together in hindsight as a pretext to reject the claim.

The Examiner has not explained why one of ordinary skill in the art would have found the YBCO manufacturing methods disclosed by *Malozemoff* and *Jin* to be unsatisfactory, or why one of ordinary skill in the art would have found *Chen*’s manufacturing method to be preferable.

In addition, the Examiner has not explained why one of ordinary skill in the art would have regarded the substitution of one alkaline earth for another to be a prerequisite for *Chen*’s manufacturing method. On the contrary, one of ordinary skill in the art would have learned from *Chen* that “barium is the preferred alkaline earth metal.”<sup>8</sup> Based on that, one of ordinary skill in the art would have learned that although he could substitute another alkaline earth for barium, he would be well-advised not to do so.

According to *KSR*,

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<sup>6</sup> *Chen*, et al., U.S. Patent No. 5,122,510.

<sup>7</sup> *Office Action*, page 12.

<sup>8</sup> *Chen*, col. 5, lines 43-44.

“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”<sup>9</sup>

The Examiner essentially states that one of ordinary skill in the art would have been motivated to switch to a completely different YBCO manufacturing method from that which the primary references disclose as being perfectly satisfactory for their intended purposes. The Examiner offers no cogent technical reason for this statement. Instead, he merely offers the conclusory remark that one of ordinary skill in the art would have found it obvious to do so simply for the purpose of doing so. Such circular reasoning falls well short of being “articulated reasoning with some rational underpinning” as required by *KSR*.

### Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fees are believed to be due in connection with the filing of this response. However, to the extent any fees are due, or if a refund is forthcoming, please adjust our Deposit Account No. 50-4189, referencing Attorney Docket No. 30020-301001.

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<sup>9</sup> *KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007).

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